Commentary

The HIV/AIDS epidemic was first recognized in the United States in 1981. Since that time, all states and U.S. dependent areas have conducted AIDS surveillance by using a standardized, confidential name-based reporting system. Because successful treatment delays the progression of HIV infection to AIDS, AIDS surveillance data alone are insufficient to monitor trends in HIV incidence or to meet federal, state, or local data needs for planning and allocating resources for HIV prevention and care programs. An integrated national HIV/AIDS surveillance system will enhance the ability to monitor and characterize populations affected by the HIV epidemic and provide information on the entire population of HIV-infected persons who have been tested confidentially. In order to acquire high-quality HIV data, CDC recommended in 2005 that all states and U.S. dependent areas adopt confidential name-based public health disease surveillance systems to report cases of HIV infection. California implemented confidential name-based HIV infection case surveillance in April 2006, and this issue marks the first time that HIV case reports from California have been included in the HIV/AIDS Surveillance Report. For more information about HIV reporting in California, visit http://www.dhs.ca.gov/AIDS/HIVReporting/.

This report presents estimated numbers of cases of HIV/AIDS (cases of HIV infection, regardless whether they have progressed to AIDS) from the 38 areas (33 states and 5 U.S. dependent areas) that have had confidential name-based HIV infection reporting for a sufficient length of time (i.e., since at least 2003) to allow for stabilization of data collection and for adjustment of the data in order to monitor trends. According to the number of reported AIDS cases, these 33 states represent approximately 63% of the epidemic in the 50 states and the District of Columbia. From 2003 through 2006, the total number of new cases of HIV/AIDS remained stable in the 33 states; however, HIV/AIDS prevalence (i.e., the number of persons living with HIV/AIDS) increased steadily: by the end of 2006, an estimated 491,727 persons in the 33 states were living with HIV/AIDS. The map on the cover depicts the estimated rates of diagnoses of HIV/AIDS in 2006, by area of residence at the time of diagnosis, for persons residing in the 33 states and 5 U.S. dependent areas with confidential name-based HIV infection reporting since at least 2003.

Surveillance data on HIV infections, compared with data on AIDS, provide a more complete picture of the epidemic and the need for prevention and care services. However, the number of new HIV diagnoses during a given year(s) does not necessarily reflect a trend in HIV incidence (i.e., new infections) because some persons were infected recently and others were infected at some time in the past. CDC has developed the serologic testing algorithm for recent HIV seroconversion (STARHS), which can distinguish recent from long-standing HIV infections at a population level. This technology has made it possible to develop a surveillance system that will provide more accurate and timely estimates of HIV incidence. CDC and its partners in state and local health departments have been working during the past several years to develop and evaluate this system. Five areas were funded in FY 2002 to pilot the methods; by FY 2005, 34 areas were funded to conduct incidence surveillance. HIV/AIDS surveillance data are used by CDC's public health partners and by professionals in other federal agencies, health departments, nonprofit organizations, and academic institutions. Recognizing the changing needs for data, CDC is committed to presenting the data that will best meet those needs. The first estimates of HIV incidence, which require the use of complex estimation methods, are expected in 2008. The monitoring of HIV incidence will be critical in evaluating progress toward CDC's goal of reducing the number of new HIV infections in the United States and in allocating resources and evaluating prevention program effectiveness.

The 2006 HIV/AIDS Surveillance Report is organized in 5 sections: (1) cases of HIV/AIDS and AIDS, (2) deaths of persons with AIDS, (3) persons living with HIV/AIDS, AIDS, or HIV infection (not AIDS), (4) length of survival after AIDS diagnosis, and (5) reports of cases of HIV/AIDS, AIDS, and HIV infection (not AIDS). In Sections 1–3, we present point estimates of case counts that have been adjusted for reporting delays and for the redistribution of cases in persons initially reported without an identified risk factor. CDC routinely adjusts data for the presentation

of trends in the epidemic. Data to estimate the number of cases of HIV/AIDS or AIDS; the number of persons living with HIV/AIDS, AIDS, or HIV infection (not AIDS); and the number of deaths among persons with AIDS have been statistically adjusted to correct for delays in the reporting of cases and deaths.

To assess trends in cases, deaths, or prevalence, it is preferable to use adjusted data, presented by year of diagnosis instead of year of report, to eliminate artifacts of reporting in the surveillance system. Therefore, for trends, the reader is encouraged to use the tables in Sections 1–3 that present trends by year of diagnosis, year of death, or year-end prevalence. Section 4 presents estimates of survival for persons whose AIDS diagnosis was made during 2002 (Table 13) and for persons whose diagnosis was made during 1998–2005 (Figures 2–4). Proportions of persons who survived for various lengths of time after diagnosis are presented by year of diagnosis, age group, race/ethnicity, and HIV transmission category.

Finally, Section 5 presents reports of cases of HIV infection (not AIDS) and cases of AIDS reported through 2006. The areas included in tabulations of reported cases of HIV infection (not AIDS) are based on the date that confidential name-based HIV infection reporting was implemented. For Tables 16, 18, 20, and 22, we used data from 50 areas (45 states and 5 U.S. dependent areas) to describe reports of HIV infection. These data, which have not been adjusted for delays in reporting, are presented by year of report to CDC. Tables that present cases by year of report represent the most up-to-date information reported to CDC; however, cases by year of report do not represent incident cases, the most recent diagnoses, trends, or deaths.

HIGHLIGHTS OF ANALYSES

Cases of HIV/AIDS and Cases of AIDS

Cases of HIV/AIDS

From 2003 through 2006, the estimated number of HIV/AIDS cases in the 33 states with confidential name-based HIV infection reporting remained stable (Table 1). In 2006, the estimated rate of HIV/AIDS cases in the 33 states was 18.5 per 100,000 population (Table 5b).

- **Age group**: From 2003 through 2006, the estimated number of newly diagnosed HIV/AIDS cases decreased among children (less than 13 years of age) and in the following age groups: 13–14, 30–34, and 35–39 years (Table 1). The estimated number of HIV/AIDS cases remained stable among persons aged 40–44 years and increased among persons aged 15–19, 20–24, 25–29, 45–49, 50–54, 55–59, 60–64, and 65 years and older. In 2006, the largest number of HIV/AIDS cases occurred among persons aged 40–44 years, who accounted for 16% of all HIV/AIDS cases diagnosed during that year.
- **Race/ethnicity**: From 2003 through 2006, the estimated number of newly diagnosed HIV/AIDS cases increased among whites and Asians/Pacific Islanders, remained stable among blacks and Hispanics, and fluctuated among American Indians/Alaska Natives (Table 1). Blacks accounted for 49% of all HIV/AIDS cases diagnosed in 2006. In 2006, rates of HIV/AIDS cases were 67.7 per 100,000 in the black population, 25.5 per 100,000 in the Hispanic population, 8.8 per 100,000 in the American Indian/Alaska Native population, 8.2 per 100,000 in the white population, and 6.7 per 100,000 in the Asian/Pacific Islander population (Table 5b).
- **Sex**: From 2003 through 2006, the estimated number of HIV/AIDS cases increased approximately 5% among males and decreased 6% among females (Table 1). In 2006, males accounted for 74% of all HIV/AIDS cases among adults and adolescents. In 2006, rates were 33.8 per 100,000 among males and 11.5 per 100,000 among females (Table 5b).
- **Transmission category**: From 2003 through 2006, the estimated number of HIV/AIDS cases increased among men who have sex with men (MSM) and remained stable among adults and adolescents with HIV infection attributed to high-risk heterosexual contact (heterosexual contact with a person known to have, or to be at high risk for, HIV infection) (Table 1). The estimated number of HIV/AIDS cases decreased among injection drug users (IDUs), MSM who were also IDUs, and among children. MSM (49%) and persons exposed through high-risk heterosexual contact (33%) accounted for 82% of all HIV/AIDS cases diagnosed in 2006.

Of all HIV infections diagnosed in 2005 in the 33 states with confidential name-based HIV reporting, 38% progressed to AIDS within 12 months after HIV infection was diagnosed. AIDS was diagnosed within 12 months after the diagnosis of HIV infection for larger proportions of persons aged 13–14 years and 35 years and older, for Hispanics, for IDUs, and for males with HIV infection attributed to high-risk heterosexual contact (Table 2).

Cases of AIDS

From 2002 through 2006, the estimated number of newly diagnosed AIDS cases in the 50 states and the District of Columbia remained stable (Table 3). In 2006, the estimated rate of AIDS cases in the United States was 12.3 per 100,000 population (Table 5a).

- **Age group**: From 2002 through 2006, the estimated number of AIDS cases decreased 64% among children (less than 13 years of age) (Table 3). The estimated number of AIDS cases also decreased among persons in the age groups 30–34 and 35–39 years (Table 3). The estimated number of AIDS cases remained stable among persons aged 40–44 years and increased in the following age groups: 13–14, 15–19, 20–24, 25–29, 45–49, 50–54, 55–59, 60–64, and 65 years and older. In 2006, the largest number of AIDS cases occurred among persons aged 40–44 years, who accounted for 20% of all AIDS cases diagnosed during that year in the 50 states and the District of Columbia.
- **Race/ethnicity**: From 2002 through 2006, the estimated number of AIDS cases decreased among blacks and American Indians/Alaska Natives, remained stable among whites and Hispanics, and increased among Asians/Pacific Islanders (Table 3). In 2006, rates of AIDS cases were 47.6 per 100,000 in the black population, 15.6 per 100,000 in the Hispanic population, 6.2 per 100,000 in the American Indian/Alaska Native population, 5.4 per 100,000 in the white population, and 3.7 per 100,000 in the Asian/Pacific Islander population (Table 5a).
- **Sex**: From 2002 through 2006, the estimated number of AIDS cases remained stable among both male and female adults and adolescents (Table 3). Males accounted for 73% of all AIDS cases diagnosed in 2006 for adults and adolescents in the 50 states and the District of Columbia (Table 3). Rates of AIDS cases in 2006 were 22.4 per 100,000 among males and 7.8 per 100,000 among females (Table 5a).
- **Transmission category**: From 2002 through 2006, among male adults and adolescents, the estimated number of AIDS cases decreased among IDUs and MSM who were also IDUs (Table 3). The numbers of males exposed through male-to-male sexual contact and high-risk heterosexual contact remained stable. Among female adults and adolescents, the estimated number of AIDS cases decreased among IDUs and fluctuated among females exposed through high-risk heterosexual contact.
- **Region**: From 2002 through 2006, the estimated number of AIDS cases decreased 10% in the West and 6% in the Northeast and remained stable in the South and the Midwest.

Deaths

From 2002 through 2006, the estimated number of deaths of persons with AIDS who resided in the 50 states and the District of Columbia decreased 17% (Table 7).

- **Age group**: The estimated number of deaths decreased among children (less than 13 years of age) and in the following age groups: 13–14, 25–29, 30–34, 35–39, 40–44, and 45–49 years. The estimated number of deaths remained stable among persons aged 50–54 years and increased in the age groups, 15–19, 20–24, 55–59, 60–64, and 65 years and older.
- **Race/ethnicity**: The estimated number of deaths of persons with AIDS decreased among whites, blacks, and American Indians/Alaska Natives. The estimated number of deaths of persons with AIDS remained stable among Hispanics and increased among Asians/Pacific Islanders.
- **Sex and transmission category**: The estimated number of deaths of adults and adolescents decreased among MSM and IDUs and remained stable among persons exposed through high-risk heterosexual contact.
- **Region**: The estimated number of deaths decreased in all regions of the United States.

Persons Living with HIV/AIDS, HIV Infection (Not AIDS), or AIDS

Persons living with HIV/AIDS

From 2003 through 2006, the estimated number of persons living with HIV/AIDS increased steadily in the 33 states with confidential name-based HIV infection reporting (Table 8). At the end of 2006, an estimated 491,727 persons in these states were living with HIV/AIDS.

- By age group, most (21%) were aged 40–44 years.
- By race/ethnicity, 47% were black, 34% white, 17% Hispanic, and less than 1% each were American Indian/Alaska Native or Asian/Pacific Islander.
- By sex, 73% of adults and adolescents living with HIV/AIDS were male.
- Of the estimated 353,825 male adults and adolescents living with HIV/AIDS, 62% had been exposed through male-to-male sexual contact, 17% had been exposed through injection drug use, 13% had been exposed through high-risk heterosexual contact, and 7% had been exposed through both male-to-male sexual contact and injection drug use. Of the estimated 131,195 female adults and adolescents living with HIV/AIDS, 73% had been exposed through high-risk heterosexual contact, and 26% had been exposed through injection drug use. Of the estimated 6,703 children living with HIV/AIDS, 92% had been exposed perinatally.

Prevalence rates of HIV infection (not AIDS)

At the end of 2006, in the 38 areas with confidential name-based HIV infection reporting since at least 2003, the prevalence rate of HIV infection (not AIDS) among adults and adolescents was estimated at 143.7 per 100,000 (Map 1). The rate for adults and adolescents living with HIV infection (not AIDS) ranged from an estimated 4.9 per 100,000 (American Samoa) to an estimated 261.7 per 100,000 (New York). The prevalence rate of HIV infection (not AIDS) among children residing in the 38 areas was an estimated 6.5 per 100,000 (Map 2). The rate for children living with HIV infection (not AIDS) ranged from an estimated zero per 100,000 in Idaho, New Mexico, American Samoa, Guam, and the Northern Mariana Islands to an estimated 25.3 per 100,000 in New York.

Persons living with AIDS

AIDS prevalence also increased steadily from 2002 through 2006 (Table 10). At the end of 2006, an estimated 436,693 persons in the 50 states and the District of Columbia were living with AIDS.

- By age group, most (22%) were aged 40–44 years.
- By race/ethnicity, 44% were black, 35% white, 19% Hispanic, 1% Asian/Pacific Islander, and less than 1% were American Indian/Alaska Native.
- By sex, 77% of adults and adolescents living with AIDS were male.
- Of the estimated 333,244 male adults and adolescents living with AIDS, 60% had been exposed through male-to-male sexual contact, 19% had been exposed through injection drug use, 12% had been exposed through high-risk heterosexual contact, and 8% had been exposed through both male-to-male sexual contact and injection drug use. Of the estimated 99,671 female adults and adolescents living with AIDS, 66% had been exposed through high-risk heterosexual contact, and 32% had been exposed through injection drug use.
- By region, 41% resided in the South, 29% in the Northeast, 20% in the West, and 11% in the Midwest.

AIDS prevalence rates

At the end of 2006, the prevalence rate of AIDS among adults and adolescents in the United States was estimated at 178.6 per 100,000 (Map 1). The rate for adults and adolescents living with AIDS ranged from an estimated 2.5 per 100,000 (American Samoa) to an estimated 2,016.5 per 100,000 (District of Columbia). The prevalence rate of AIDS among children in the United States was estimated at 2.2 per 100,000 at the end of 2006 (Map 2). The rate for children living with AIDS ranged from an estimated zero per 100,000 in Idaho, Montana, Utah, American Samoa, Guam, and the Northern Mariana Islands to an estimated 36.5 per 100,000 in the District of Columbia

Survival after AIDS Diagnosis

Table 13 is limited to data on AIDS cases diagnosed in 2002 in order to describe the survival of persons whose diagnosis was made relatively recently, but far enough in the past to permit a meaningful measure of

survival. Figures 2, 3, and 4 illustrate the proportion of surviving persons among persons whose diagnoses were made over a longer period, 1998 through 2005.

- Survival (the estimated proportion of persons surviving a given length of time after diagnosis) increased with the year of diagnosis for diagnoses made during 1998–2000. Year-to-year differences were small during 2001–2005 (Figure 2).
- Survival decreased as age at diagnosis increased among persons at least 35 years old at diagnosis and in comparison with persons younger than 35. Survival was similar for the age groups 13–24 and 25–34 (Figure 3).
- Survival was greatest among MSM and among children with perinatally acquired HIV infection (Table 13). Survival was intermediate among male and female adults and adolescents who had heterosexual contact with someone known to be HIV infected or at high risk for HIV infection, as well as among MSM who also were IDUs. Survival was lowest among male and female adults and adolescents who were IDUs.
- Survival, particularly at more than 48 months after diagnosis, was greater among Asians/Pacific Islanders, whites, and Hispanics than among blacks (Figure 4). Results were unstable or inconsistent for American Indians/Alaska Natives because the numbers of persons in this racial/ethnic category were small.

Reports of Cases of HIV/AIDS, AIDS, and HIV Infection (Not AIDS)

Tables 14–23 describe reports of cases of HIV/AIDS, AIDS, and HIV infection (not AIDS). Tables 16, 18, 20, and 22 are based on reports of cases of HIV infection (not AIDS) through 2006 from the 50 areas that had implemented name-based HIV infection reporting. Note that **not** all cases of HIV infection (not AIDS) or AIDS reported in 2006 reflect diagnoses made during 2006; rather, the reported cases include cases diagnosed during earlier years.

Reports of cases of HIV infection (not AIDS)

Through 2006, a total of 287,954 persons were reported as having HIV infection (not AIDS) in the 50 areas with confidential name-based HIV infection reporting (Table 16) (see Technical Notes for discussion of surveillance of HIV infection [not AIDS]). Five states (Florida, New Jersey, New York, North Carolina, and Texas) reported 137,507 (48%) of the 287,954 cumulative cases of HIV infection (not AIDS) reported to CDC. In 2006, 4 states (California, Illinois, New York, and Pennsylvania) reported 22,417 (42%) of the 52,878 cases of HIV infection (not AIDS).

- In 2006, of the 52,312 reported cases among adults and adolescents, 75% were in males and 25% were in females (Table 18).
- In 2006, 566 cases in children were reported.

Reports of AIDS cases

Through 2006, a total of 992,865 persons in the United States had been reported as having AIDS (Table 14). Three states (California, Florida, and New York) reported 43% of the cumulative AIDS cases and 37% of AIDS cases reported to CDC in 2006. In the United States, the rate of reported AIDS cases in 2006 was 12.9 per 100,000 population. When the U.S. dependent areas were included, the rate of reported AIDS cases ranged from zero per 100,000 (American Samoa, Guam, and the Northern Mariana Islands) to 146.7 per 100,000 (District of Columbia).

- In 2006, males accounted for 73% and females for 27% of 38,916 reported AIDS cases among adults and adolescents (Table 17).
- In 2006, 86 AIDS cases in children were reported.

Additional Resources

The following were prepared by using HIV/AIDS surveillance data:

- Selected *MMWR* articles at http://www.cdc.gov/hiv/resources/reports/mmwr/
- Public-use slides at http://www.cdc.gov/hiv/topics/surveillance/resources/slides/
- Other surveillance reports at http://www.cdc.gov/hiv/topics/surveillance/resources/reports/
- Public-use version of the AIDS surveillance data set (AIDS Public Information Data Set [APIDS]) at http://www.cdc.gov/hiv/software/apids.htm

Suggested Readings

CDC. Advancing HIV Prevention: New Strategies for a Changing Epidemic—United States, 2003. *MMWR* 2003;52(15):329–332.

CDC. Dear colleague letter: CDC recommends that all states and territories adopt confidential name-based surveillance systems to report HIV infections. http://www.cdc.gov/hiv/pubs/070505_dearcolleague_gerberding.pdf. Published July 5, 2005. Accessed March 11, 2008.

CDC. Epidemiology of HIV/AIDS—United States, 1981–2005. *MMWR* 2006;55(21):589–592.

CDC. Guidelines for national HIV case surveillance, including monitoring for HIV infection and AIDS. *MMWR* 1999;48(RR-13):1–31.

CDC. HIV prevention strategic plan: extended through 2010. http://www.cdc.gov/hiv/resources/reports/psp/. Published October 2007. Accessed March 11, 2008.

CDC. Revised recommendations for HIV testing of adults, adolescents, and pregnant women in health-care settings. *MMWR* 2006;55(RR-14):1–17.

CDC. Twenty-five years of HIV/AIDS—United States, 1981–2006. *MMWR* 2006;55(21):585–589.

Glynn, MK, Lee LM, McKenna MT. The status of national HIV case surveillance, United States 2006. *Public Health Rep* 2007;122(suppl 1):63–71.

Janssen RS, Satten GA, Stramer SL, et al. New testing strategy to detect early HIV-1 infection for use in incidence estimates and for clinical and prevention purposes. *JAMA* 1998;280(1):42–48.

Lee LM, McKenna MT. Monitoring the incidence of HIV infection in the United States. *Public Health Rep* 2007;122(suppl 1):72–79.